

EcoCARE Pacific Trust/ Engineers Without Borders Install Solar PV Projects at 2 Tongan High Schools

In collaboration with EcoCARE Pacific Trust, EWB from Canterbury University, EWB from Auckland University and the Ministry of Education in Tonga, a solar powered water pumping system was installed at Tonga College on Tongatapu and a solar powered electrical generation system was installed at Vava'u High School.

These projects illustrate the practical benefits and difficulties of installing alternative energies into Pacific Island communities.

They include a significant educational component that we hope will play a role in the ongoing sustainability and development of local capacity of the community to continue to benefit from cheaper, reliable renewable energy.

EcoCARE Pacific Trust
health, environment and education



engineers
without borders
New Zealand

Pacific Island nations pay high prices for their power as most is generated by fossil fuel which must be shipped to the primary ports and then double and triple handled to the secondary and tertiary ports. Electricity prices in Tonga can vary between \$0.86/kWh and \$1.04/kWh which means that although state of the art electronic technologies offer significant benefits often these benefits are not able to be realised because the cost of running a particular piece of equipment is impracticable.

The average school in Tonga uses less power than the average household in NZ. The average household in NZ uses approximately 3.4kWh whereas Vava'u High School which has over 600 students uses approximately 3.2kWh. Even with this low power usage the school has to close numerous times each year because it is unable to pay for water (which must be pumped) for toilets and drinking and this situation is not peculiar to Vava'u High School.

In November 2007 a group of Canterbury EWB went to Tonga to scope out the project at Vava'u HS with Russell Taylor of EcoCARE and Prof. Pat Bodger of the College of Engineering at UC.



After some considerable discussion between the Auckland and Canterbury chapters that included input from mentors it was decided that both groups would participate in solar alternative energies projects.

Auckland decided to install a solar powered water pumping system at Tonga College on Tongatapu and Canterbury decided to install solar panels to supplement the power requirements of Vava'u HS.

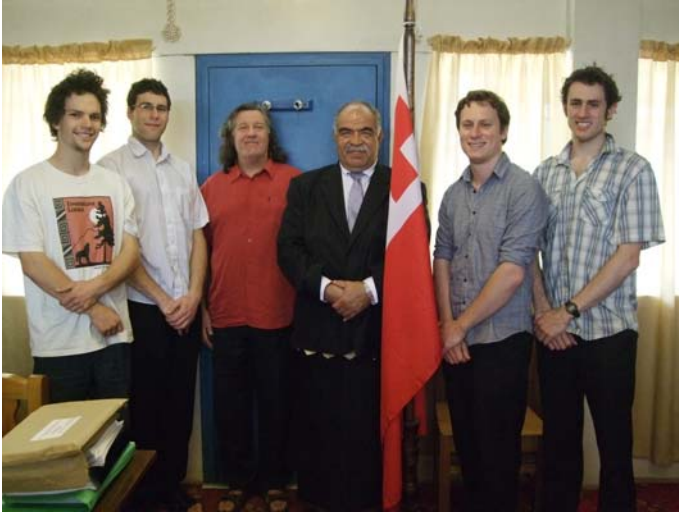
EcoCARE projects place significant emphasise on an educational component to develop sustainability and local capacity. Both EWB groups were asked to include educational packages that utilise the technology as an educational resource.

EWB students designed posters and lesson packages for junior and senior high school for physics, chemistry, maths, statistics, mechanical workshop and so on that focus on the solar systems and alternative energy as educational resources.

In this way the Tongan students become informed and participate with the technology. The Ministry of Education in Tonga is including these lessons into their national curriculum so that all Tongan students will be aware of alternative energies and how to sustainably utilise these new technologies.



- Upon arrival the students from the University of Canterbury EWB and Russell Taylor of EcoCARE met the Minister of Education (Hon. Dr. Tevita Palefau).



- The panels and a party of 6 travelled for 24 hours by ferry to Vava'u, 300 km north while the rest of our group travelled by plane.



- A Noble from Vava'u had died in Tongatapu and his body and entourage travelled by ferry with us. There are no seats on this ferry so everyone lay, sat or stood on the steel decks for the 24 hour journey.
- Along the way we passed by the islands of the Ha'apai group and boats would motor out to collect or deposit parcels or passengers. A live pig in a wooden crate on the little boat in the picture below is being offered for the feast to be held at the funeral in Vava'u.



- We arrived in Vava'u at 10:30pm and the wharf was filled with mourners dressed in traditional costume waiting to meet the body of the noble and his entourage.
- Everything stopped while the body was carefully carried down the gang plank and placed into a converted truck.



- Once the body had been taken from the wharf the place reverted back to a bustling third world dock with fork lifts going into and out of the ferry, people yelling and vehicles picking up their goods and moving on.
- We were met by the deputy principle and principle of VHS. The team was taken to our accommodation and began work the very next day.



- Sunday is the day of rest in Tonga and no-one is supposed to work so we were invited to go with Tuamelie to his island, Nuku.
- Nuku is a very beautiful tropical island where his family had organised a feast for us.



- We met the Auckland team when we returned to Tongatapu and they have since completed their solar powered water pumping station at Tonga College.
- Both projects have been completed on time and are functioning to supplement electrical and water needs of these schools.
- This has been more than another aid project. The students have been responsible for the whole process from project management, commissioning, implementation, education, installation fund raising, fund management, report writing, cross cultural exchange, wow, the list goes on, an awesome experience.



- Thanks must go to the University of Canterbury College of Engineering, Christchurch Rotary Club, Air New Zealand, EPECentre, NZ Aid, Air NZ, Pacific Blue, the Hon. Sam Viapulu, the Ministry of Education and Ministry of Energy in Tonga and the mentors and organisations that have made these projects possible.